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ABSTRACT

There is no conclusive evidence as yet that television has provided sufficient cause for the decline in scores on the Scholastic Aptitude Test and other measures of academic achievement or aptitude, although it may be one of several elements in a complex causal system. The major studies show that television viewing, after the early school years, tends to be associated with lower-than-average achievement, although the relative extent to which viewing affects achievement or unsatisfactory achievement encourages children to take refuge in television is not fully understood. Television reduces reading time, social interaction time, and the opportunity to practice certain skills necessary to academic excellence. It tends to reduce the average level of intellectual stimulation available to a child after the age of 9 or so. The trend indicated by the evidence is that television viewing patterns belong to a group of strong variables that interact with each other, and with school and test performance--probably with negative effect. (Author/EVH)

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Television and the Test Scores

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INTRODUCTION

There is no persuasive evidence that children's and young people's use of television has caused the decline in Scholastic Aptitude Test (SAT) scores. Indeed, a social phenomenon as broad as this one is -- a steadily declining trend in college entrance examination scores as well as in other tests, some of which measure different cognitive skills and different grade levels -- over a 12-year period, would not likely be explained in terms of a single cause. If television has anything at all to do with the decline in test scores, it is probably not the cause, but rather a cause, perhaps part of a complex causal system.

This paper examines several questions that might throw light on the relationship:

1. Does the timing of television's growth in this country relate to the timing of the decline in the test scores in a way that suggests there could be a causal relationship?
2. Has the television behavior of young Americans been of a kind to suggest that it could have substantially affected the children's school work and presumably, therefore, their performance on academic tests?
3. Is there any hard evidence that television exposure has, in fact, affected academic performance?

The Timetable of Television

There were fewer than 100,000 television receivers in the United States at the end of the war in 1945; almost all of these were in the northeastern part of the country. In 1947, there were about 300,000; in 1950, about 10 million. Bogart (1956) has extracted these figures, describing the growth of television in the early years, from Market Research Corporation reports:

	September 1949	October 1950	July 1951	July 1952	July 1953	July 1954	July 1955
U.S. Total. . . .	6%	18%	27%	37%	49%	58%	68%
Region							
Northeast . . .	13%	35%	45%	59%	69%	77%	85%
South	1	4	13	17	30	37	54
North Central .	4	15	27	39	50	61	70
Mountain and Southwest. . .	*	3	10	16	31	40	52
Pacific	5	19	26	34	47	56	66
City Size							
Farm.	*	3%	7%	12%	23%	28%	43%
Under 2,500 . .	*	5	9	16	26	41	56
2,500 to 50,000	*	9	16	18	31	39	53
50,000 to 500,000. . . .	*	17	28	37	51	64	75
500,000 and over	14%	40	53	69	77	81	87

(continued)

	September 1949	October 1950	July 1951	July 1952	July 1953	July 1954	July 1955
Income							
Upper fourth. .	7%	24%	33%	45%	58%	70%	81%
Next fourth . .	7	19	32	41	55	63	76
Next fourth . .	6	18	28	40	50	59	69
Lowest fourth .	3	12	18	23	32	41	48
Education							
Grade school. .	4%	16%	23%	31%	43%	51%	62%
High school . .	7	22	34	45	57	65	75
College	6	17	24	38	48	61	73
Family Size							
1 and 2 members.	4%	12%	19%	28%	38%	48%	59%
3 members. . . .	6	18	30	41	52	65	73
4 and 5 members.	7	22	35	45	58	69	78
6 and more members	6	19	27	39	53	55	66
Age of Housewife							
Under 35. . . .	8%	23%	36%	44%	58%	65%	75%
35 through 44 years.	8	23	37	48	60	68	74
45 years and over	3	12	19	28	40	49	61
Presence of Children							
5 years and under.	7%	23%	36%	48%	54%	65%	75%
6 to 12 years .	7	22	35	46	56	65	76
13 to 20 years.	6	18	28	39	49	58	71
No children . .	4	13	21	29	37	50	61

* No data

This is an exponential curve of growth -- the familiar S-curve of diffusion of innovation. The television growth curve is distinguished from that of other technological innovations -- the telephone, automobile, and radio, for example only by its sharp slope. The growth curve extended throughout the 1950s, flattening out in the 1960s. About 94 per cent of all homes in the United States are believed to have installed television by 1965. By 1967, about 98 per cent of homes had their own sets. The percentages have not increased since then, although more receivers have been added as multiple sets in homes, portable sets, and installations for schools and other gathering places. Also, many black and white sets have been replaced by color. Thus, the curve was nearly flat until a year or two after the war of 1939-45, rose precipitously for the next 15 years, and has been essentially flat (because of saturation) since 1967.

A year of special interest to us is 1963, when the SAT scores first turned downward. In that year there were about 56 million television receivers in the United States, representing over 90 per cent of homes. About 3 million of these receivers were color. In other words, television was already close to saturating the American home market, and the changeover to color was well under way.

It apparently takes a period of time for television's effect, if there is one, to show up in children's school work. The first major studies (Himmelweit, Oppenheim, and Vince, 1958, in England; Schramm, Lyle, and Parker, 1961, in the United States and Canada) found no significant relationship between children's television exposure and their school performance when television was relatively new in the communities where they lived. NHK[1] researchers (NHK, 1969; Faru, 1971) found no significant relationship of this kind in Shizuoka in 1957 or 1959 when television was new there. But they went back to Shizuoka several times in the next ten years, and were able to observe a relationship in 1967 and 1969, when television was ten years old and almost all homes had receivers. Therefore, it is necessary to look at the timetable of television ten years or so before the decline in test scores became evident.

In 1953, for the first time, more than half the children in the United States were exposed to television in their own homes. Perhaps a quarter had been watching television at home since the age of three or four, and 80 to 90 percent had some exposure to television, if not in their own homes then in the homes of friends or relatives.

In 1963, therefore, more than half the young people who took the SAT had been exposed to television at home for ten years or more, 75 to 80 percent had been exposed for at least five years, almost all of them had television at home and watched it several hours a day.

What constitutes a critical mass of children, television, and time to make a (perhaps fairly small) effect reveal itself on an academic achievement test? At this time, there is no way to answer that question scientifically, but it seems reasonable to believe that such a critical mass would have been available by the early 1960s. A sufficient number of children and young people would have spent a sufficient number of hours watching television, there would have been sufficient substitution of television for other activities (reading, for example), sufficient practice in the cognitive and perceptual patterns of television, sufficient learning of television's content, to make a difference if there were going to be one. We can not claim, at least on the basis of this evidence, that the kind of effect we are talking about did indeed occur, but if it did the time would have been ripe for it by 1963.

Let us look at the nature of the television experience to try to decide whether it is of the kind to affect academic performance.

Television -- the Thief of Time

Probably no technological innovation in this century has so influenced time allocation in human societies as has television. A team of researchers sponsored by UNESCO in the mid-1960s, made 14 time studies in 12 countries -- two samples in the United States, two in West Germany, one in Latin America, and nine in East and West European nations. The results were reported by Szalai (1966), Robinson and Converse (1970), and Robinson (1971).

1. Nippan Hoso Kyokai -- The Japanese Broadcasting Corporation.

From the resulting time-use diaries it was possible to see how the acquisition of different technological devices changed the time allocations of their owners. Surprisingly, owning an automobile cost the owner only about six additional minutes per day on transportation, although he obviously must have traveled farther. Owning one of the new "labor-saving" household appliances like clothes washers, dish washers, or vacuum cleaners made almost no difference in the amount of time devoted to house work. But when a family acquired television, the time its members spent on media was increased by an average of 58 minutes a day!

Americans in the sample spent more time on television than did people in any of the other countries studied, probably because more was available. However, when only the diaries of persons with television in their own homes were examined, the daily television time was almost the same across samples. And this despite the striking differences in programming and the amount of programming available!

In that study, television accounted for about 40 percent of the leisure time of Americans. The time they spent on television was about three-fourths the total time spent on mass media, indicating that large amounts of time were stolen from radio, movies, and perhaps newspapers and magazines. Among 37 principal activities on which data were recorded, television was third only to sleep and work as a consumer of adult time.

That television was displacing other media had been documented ten years earlier than the UNESCO study, when Coffin (1955) reported on the daily media behavior of respondents in Fort Wayne, Indiana. Television had recently come to that city, and individuals who had acquired sets were interviewed for time diaries some months before and again after its advent. The summary table was as follows:

	Before television was available in the home	After a receiver was purchased	Difference
Magazines	17 minutes per day	10 minutes per day	-7 minutes
Newspapers	39	32	-7
Radio	122	52	-70
Television	12	173	+161
Total	190	267	+ 77

These television owners were transferring about 77 minutes per day of leisure time beyond what came from the media. Leisure time is not indefinitely expansible: those 77 minutes a day, approximately nine hours a week, must have come from some other activities. Where did they come from?

Some movies, of course; over the whole sample, perhaps an hour a week. But as the UNESCO figures show, the new time for television came also from sleep, from social time away from home, from reading books, from conversation, from travel and other leisure activities, and from religious activities.

Coffin's figures are for adults, but the same general pattern of displacement is also true for children.

Children's time with television has been documented now for more than 15 years, not only by the early large studies (Himmelweit et al., Schramm et al., previously mentioned), but also by a large body of research done under the auspices of the Surgeon General and reported in the fourth volume of the study's report (edited by Rubenstein, Comstock, and Murray, 1972). Therefore, we have a wide data base over groups and over time. And the figures are impressive.

By the age of two, most children in the United States have begun to spend some time with television. Before the age of six, most have become purposeful television viewers, with regular viewing times and favorite programs (Lyle and Hoffman, 1971; Murray, 1972; Gerbner, 1971). The modal viewing time, even in the preschool years, is more than two hours. Murray (in the report cited above), studying inner-city kindergarten and first grade children, found a range of viewing time from 5 to 42 hours a week, with a mean of 21 hours, 29 minutes. Stein and Friedrich (1971), studying nursery school children in Pennsylvania, reported mean weekly viewing times of 34.56 hours for boys, 32.44 hours for girls. Lyle and Hoffman (1971) found that a large sample of first grade children in the Los Angeles area averaged a little more than three hours a day in the first grade. Lest we mislead ourselves into thinking that this is peculiarly American behavior, it should be noted that Japanese children begin their television viewing at least as early and view at least as much as American children (NHK, 1969; Furu, 1971). And the same thing is probably true anywhere in the world where television is available as readily as it is in Japan and the United States.

During the first 20 years of life in America, the chart of television use is curvilinear. It is highest at the beginning of the teen years, and trails off after that. Lyle and Hoffman (cited above) found, for example, that their sample viewed slightly more than three hours an average day in the first grade, peaked at about four and one-half hours in the sixth grade, and averaged just under four hours a day in the tenth grade. Chaffee, McLeod, and Atkin (1970) reported that the senior high school students in their sample watched about one and one-quarter hours less, on the average, than their junior high school students. There is considerably more viewing by children beyond the first few grades on Saturday and Sunday than on school days. Lyle and Hoffman, for example, found that sixth graders viewed almost twice as long on Sunday as on an average week day. One more characteristic of television viewing is that, both for young people and adults, blacks view more than whites, blue collar families more than white collar families (for example, Greenberg and Dominick, 1969; McIntyre and Teevan, 1971).

And the amount of viewing among children and young people has been increasing. Average viewing times rose about an hour per day in the 1960s. Lyle and Hoffman, in 1970, repeated a part of the Schramm, Lyle, Parker study of 1959 (published 1961). These were the comparisions:

Median self-estimates of viewing time for a weekday

	1959 San Francisco		1970 Los Angeles	
	Boys	Girls	Boys	Girls
First grade.	2:00	2:00	Not available	
Sixth grade.	2:30	2:30	3:19	3:24
Tenth grade.	2:45	2:48	3:03	3:13

Suburban sample

	1959	1970 Boys	1970 Girls
Weekdays:			
First grade.	2:18	3:32	3:26
Sixth grade.	2:30	3:26	3:40
Tenth grade.	Not available	3:13	3:26
Sundays:			
First grade.	2:24	2:15	3:19
Sixth grade.	3:54	6:37	6:38
Tenth grade.	Not available	5:38	5:40

A corresponding increase in viewing during the 1960s has been reported in Japan. Comparing two surveys conducted by the NHK Radio and Television Culture Research Institute in 1959 and 1967, Furu (1971) noted that the total viewing hours for a four day period, including Saturday and Sunday, increased by an average of four hours for fifth grade boys, four and one-half hours for fifth grade girls, and five and one-half hours for seventh grade boys and girls.

The importance of this increase may be considerable. If the attraction of television for children was strong in the 1950s, it must have been no less in the 1960s and early 1970s. (Indeed it must have been no less in the 1960s and early 1970s.) In fact, it must have been growing during the years that the decline in college entrance scores began to be noticed.

These figures are probably somewhat overestimated. Bechtel, Achelpohl, and Akers (1971) installed videotape equipment in 20 homes to record time actually spent in viewing, as contrasted with diaries kept by viewers and with their estimates of the previous day's viewing. They found a great deal of time in which viewers' attention strayed from the television set, they engaged in other activity or went out of the room for a while; and the researchers suggested viewers' diaries probably overestimate actual viewing time by about 25 percent, and viewers' figures on the previous day's viewing overestimate it by 40 to 50 percent. A sample of 20 families is too small to be definitive, and the average difference may therefore be less than Achelpohl et al., have reported. But we must assume that such figures on viewing time as we have cited in the preceding paragraphs are somewhat larger than the true figures.

Suppose, however, that the figures given in those standard studies were as much as 25 percent overestimated. That would mean that children for 14 years or so before they take the SAT spend on an average between two and three hours, rather than between three and four hours, viewing television per day. In their first 16 years of life, therefore, and before they take a college entrance examination, they would have spent somewhere between 10,000 and 15,000 hours watching television. This is substantially more time than they spent in school, very likely more than they spent in play, in fact, more time than they spent doing anything else except sleeping.

Television and a Child's Life

What might have been the effect of this vast expenditure of time?

The first major American study of television and children was entitled Television in the Lives of Our Children, and ever since then (1961) we have been trying to understand what part the medium really plays in the lives of what sorts of children. That it is important to children, that it has an influence on their lives, we have no doubt; but we have been somewhat surprised at how much they take it for granted, how soon they become blasé about it. Television has become for today's children a common and expected part of life. If one of our children, 50 years ago, had spent one-sixth of all his time in an environment very different from his usual one -- for example, a country child in the city, a city child on the farm, a poor child in a millionaire's house -- we would have expected the experience to have had a significant effect on that child's fund of knowledge, his values, and his behavior. We should expect the same, now, of children who spend so much time in the very different, exciting, vivid world of television.

About a child's life with television we know at least three things with some confidence: it displaces other activities and in that way helps to create a different life style; a great deal is learned; and the experience develops a child's way of perceiving and learning that is different from the reading and discussion most classrooms emphasize.

From a large number of studies of children's television behavior, we know that children with television, as compared to those without it:

-- overwhelmingly think of television as their favorite medium, and as a result spend less time listening to radio or going to the movies -- functional equivalents for their television experience;

-- go to bed later;

-- are less likely to be read to by their mothers before they themselves learn to read;

-- spend less time reading when they do learn how to read;

-- spend less time playing with other children away from their own home.

In addition, television seems very close to them. They say (Lyle and Hoffman, 1971, table 64) they would be more likely to watch television than engage in other activities, for entertainment, for relaxation, and for relief from loneliness. The same study reported that television intrudes both into their play and their dreams. About half the children studied said that they sometimes "played out" what they saw on television,

and 40 percent of them said they remembered dreaming about things they had seen.

Does television time interfere with homework? There is very little hard evidence. In trying to answer the question we are reduced mostly to children's own reports, parents' worries, and a few conjectures by teachers, most of these from the early years of television. Remmers' survey of teenagers (1953) found two out of five thought television interfered with their preparation for school work. Battin (1954) found that a fifth of the children she studied said that television interfered with their homework. Lewis (1951) found that 69 percent of children in television homes said they did their homework before they watched TV. Witty (1950 et seq.) in his Evanston surveys found many teachers and parents critical of television's suspected effect on study and homework. NHK's studies of attitudes toward TV (see NHK, 1969) found that 55 percent of children in the fourth grade, 58 percent in the seventh grade, and 71 percent in the tenth grade said they thought television disturbed their homework. As contrasted with that, only 4 percent in the fourth, 4 percent in the seventh, and 5 percent in the tenth grade, felt that television was a useful source of knowledge. On the other hand, 46 percent of children in the fourth grade, 36 percent in the seventh, and 35 percent in the tenth grade felt that the printed media were sources of useful knowledge. One other possible effect of media on homework, little studied as yet, is the apparently growing habit of doing homework with radio turned on to music or television turned on to an entertainment program. It has been estimated that about half the children who are assigned homework study with the radio for background, and an unknown but increasing proportion use television for the same purpose.

Television, therefore, may be affecting the amount and quality of homework. If so, along with the later bedtimes, it might make for some sleepy children in school the next morning; and this, together with the lesser amount of reading or being read to, might affect school performance.

But the greatest direct effect of television time on children may well be what it teaches them to do, rather than what it keeps them from doing.

Nothing is more characteristic of studies of children and television than reports by the often amazed authors of how much children learn from the experience. McLuhan (1964) and others writing in this vein have sometimes asked why educators concern themselves with school television when the real television school goes on all the time, outside school, with the teachers paid chiefly by NBC, CBS, and ABC.

"Television can be considered to be a window on the world, a school if you will, through which the child perceives his society and then learns from repeated example to cope with the vicissitudes of living," concluded one of the research coordinators of the Surgeon General's study (Murray, 1972). This sums up the general impression of many scholars. Yet it is a peculiar kind of world that a child sees through the window, and a peculiar kind of school that teaches the child to cope. It is a world of instant heroes and of instant news events that are often forgotten before one learns how the story "comes out." It is a world full of violence, and yet no one seems to feel any pain or spill any blood. It is a world in which most of the people are stereotyped and

one dimensional. Taxi drivers all have the same set of characteristics; women are locked into a set of occupations and behaviors that are more characteristic of women a half century ago than women today; cops are all of one kind, and so are crooks, and the crooks usually have quite a good time until they are caught, which is usually just at the end of the broadcast. Power and prestige seem to belong to those who command violence, those who are beautiful, those who can be entertaining and handsome before a camera and speak well into a microphone. Ideas and policies are not something to be explored and debated and studied in depth, but rather something to be dashed off with a summary sentence or an example. News is something that goes with a good picture. And for that matter, children and young people do not view much news anyway. McIntyre and Teevan (1971) reported that less than 20 percent of their teenage sample were news viewers, and Lyle and Hoffman (1971) found that their sample -- first, sixth, and tenth grades -- almost totally avoided news programs in favor of more exciting entertainment.

It is a curiously limited world to which most children are introduced, most of the time. Michael Arlen in McCall's (February 1971, quoted in Lesser, 1973) said what he thought of it without mincing words: "To pass through childhood," he wrote, "when one's imagination, one's sense of the possibilities of the world is developing, and have it touched only, or mostly, by a piece of boffo-funny mechanistic claptrap such as McHale's Navy seems a damn shame."

In general, it is a world that would seem not to contribute greatly to intellectual growth. A bemusing section in the Schramm, Lyle, Parker book (1961) compared learning by children in two Canadian towns, one with television, the other without it. The children in "Teletown" came to the first grade with a vocabulary, measured on the Lorge tests, about a year in advance of those from "Radiotown" (the one without television). In the early school years the children who had experienced television were more familiar with names of national and foreign leaders, with world capitols, with places like "Broadway and 42nd Street" or "the White House." By fourth grade, however, the vocabulary advantage no longer existed. By sixth grade, students from the town without television demonstrated that they had less information about public affairs, although more about entertainment personalities.

Thus, although a great deal of incidental learning does result from television, it is not typically the kind that raises scores on achievement tests. Behaviors, customs, clothes are copied, names are learned, phrases are added to one's vocabulary, skills are learned by modeling (how to catch a baseball or block for a quarterback, how to make love, how to use a hand gun). But the experience usually makes little contribution to reading or mathematics skills. The pupil has no opportunity to ask any questions, or talk things over with his teacher. The homework he is assigned (by implication) is to practice what he finds attractive in what he has seen, and to buy or persuade his parents to buy items that are advertised.

It is necessary, therefore, to think in two different ways of the time a child spends on television. It keeps him from doing certain things he might otherwise do that would contribute to his performance in school. It probably makes his bedtime later, causes him to read less and be read to less, and in some cases interferes with study at home.

It leads him to spend a great deal of his leisure time in an absorbing world which, for most children, is intellectually limited and is not the kind of preparation for doing well on an SAT test. We have no evidence that permits us to say that these experiences do affect test performance. We can only say that they might.

Still another aspect of children's use of television may be related to academic performance, although we know very little about how it works. This is the shifting of a major part of a child's learning time from the linear digital encoding associated with reading to the iconic simultaneous kind of encoding which is a chief part of watching television. McLuhan (1962, 1964) and others have written speculatively about the possible effect of this change upon personality and society; and some preliminary work has been done on the different encoding functions of the right and left hemispheres of the brain. This is not the place to go into that. Up to this point in research we can say very little with assurance about what may be happening, beyond the fact that children are now getting 15 to 20 hours a week more practice in learning from pictures than they used to, and a little less practice in learning from print.

But the fact remains that after 300 years of exercising the left hemisphere of the brain (the logical, verbal, linear side) our young people have now reversed the balance and are emphasizing the right hemisphere (the visual, affective, simultaneous one). This may be the most important of all the effects we have mentioned. Some signs are beginning to appear. A five-year evaluative study of El Salvador television (for a summary, see Mayo, McAnany, Hornik, 1976) found few significant differences in cognitive learning, on curriculum-referenced tests, between television and control groups, but did find a pronounced and increasing difference in the performance of the two groups on general ability, measured over five years. The major contribution to the increase in general ability scores came from the nonverbal parts of the test. Similarly, the National Assessment tests have revealed a changing style in writing that derives less from literary models and print than from the speaking styles common to the broadcast media. These are only straws in the wind. They do not prove that television has had anything to do with the decline in test scores. But this possible effect of television on learning is something we must watch and study during the years to come.

Cause and Effect

We have worked, so far, in the realm of the perhaps and the possible. Was the timing such that there could have been an effect of television on the declining test scores? Was children's television behavior a type that might have affected their behavior in the classroom, and subsequently on national tests? Now we must ask what hard evidence exists that there actually has been such a relationship between television behavior and academic behavior.

The problems of designing research on that relationship include two that are of considerable practical importance. It is almost impossible now, in this country, to find a suitable control group without television. In fact, it was already impossible in 1958 when this author was

scouting for comparable cities or towns of at least 5,000 people, some of whom would not yet have television so that children who had television could be compared with those who did not. One town was found that received no broadcasts directly, and had only recently installed cable for which there were as yet only a few hundred subscribers, all of them readily identifiable from the cable company's records. But a little scouting around the town revealed that a very large proportion of the children seemed to watch television regularly. Further investigation revealed: (a) a number of potential subscribers had connected surreptitiously to the cable, (b) others had bought receivers and pointed their aerials at a flat mountain from which they could receive fuzzy reflections of a broadcast that originated more than 100 miles away, and (c) a high proportion of the children spent several hours a day with friends or relatives who did have television. After a few experiences of this type, my colleagues and I went to two remote towns in western Canada that represented the best experimental-control combination we could find.

That kind of experimental comparison was possible in England in 1956 when Himmelweit and her colleagues were studying the effect of television, and (just barely) in British Columbia in 1958 when data for Television in the Lives of Our Children were being gathered. It was still possible in the late 1950s in Japan when the first Shizuoka studies were being conducted. It is no longer possible, nor has it been for some years, in any of those countries. When Furu made his major study in and near Tokyo at the end of the 1960s he had no such control group, and was restricted to comparing heavy viewers with light viewers. This would have been the only comparison available in this country to the scholars who worked on the Surgeon General's study in 1969 to 1971. And comparing the effect of watching a lot of TV with that of less TV is obviously not the same thing as comparing the effect of TV with that of no TV.

The studies for which a control group without TV was available (Himmelweit, Oppenheim, and Vince, in England; Schramm, Lyle, and Parker, in Canada; and the early NHK studies in Shizuoka, Japan) were done when television was relatively new in the experimental areas, and, as mentioned previously there is good reason to think that it takes some time for the impact of television on school performance to become evident. This puts the researcher in a cruel bind: apparently he cannot demonstrate an effect when a suitable control group is available, and when the effect should be visible there is no control group of the kind he needs!

A second problem with research on this topic: it is fairly clear that the relationship of television viewing to school performance is not a simple one. A simple correlation is probably not sufficient. For example, Shuttleworth and May (1933) in their Payne Fund study of children and films found that heavy movie goers averaged lower than others in both school grades and deportment. But readers asked quite properly what this meant. Was it that heavy movie going caused children to study less or be sleepy in the mornings, or for some other reason to do less well in school? Or that frustration in school drove some children to try to forget their dissatisfactions in the movie theater? Or that some third variable or variables (intelligence, perhaps) led less gifted children both to do less well in school and be more willing to escape into movies? This is the problem of interpretation that television researchers face today when they find a negative correlation between amount of television viewing and school or test grades.

For these and other reasons the early studies of children and television did not report very striking effects of viewing on school work. Witty in his series of Evanston studies (fifth report, 1954) found that the bottom fourth of children in grades 3 to 6 (in respect to academic records) averaged 26 hours a week viewing television, whereas the top fourth averaged only 20 hours. A study by Xavier University in Cincinnati in 1950 (Xavier, 1951) matched children in TV and nonTV homes on their tested mental age, then compared their performance on the Metropolitan Reading Test and an Arithmetic Proficiency Test. There were no significant differences between the scores of children in TV and nonTV homes, nor between TV homes in which parents strongly controlled their children's viewing and those in which viewing was only lightly controlled.

Himmelweit's study in England came at a time when control groups were still possible. She gave teachers a form on which they were asked to compare the school performance of 172 pairs of children for several subjects, without being told which child was a television viewer and which one was not. The five-point scale she used produced these judgments by the teachers:

Control child much better than viewer.	.24%
Control child a little better than viewer.	.23%
Control child and viewer much the same	.17%
Viewer a little better than control child.	.23%
Viewer much better than control child.	.13%

Thus, 47 percent of the control (nonTV) children were judged as doing better than the controls; 36 per cent of the controls were doing better than the TV group. This trend toward better school work on the part of the controls was not statistically significant.

Himmelweit's summary:

"On the whole we find that viewers are more or less able to hold their own, generally scoring just a little below their controls in the same classroom. This seems to be true for all sub-groups of age, sex, class, and intelligence, except for the brighter children. In both age groups these seem to fall behind a little more often.

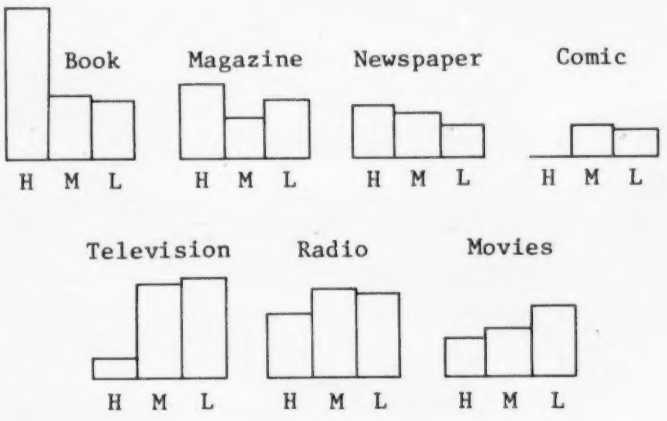
"Television had not led viewers to take a special interest in any one school subject; nor were they markedly better or worse at one subject rather than another. The very frequent showing of information programmes about nature, other countries, and current affairs had made little impact here; the viewers' performance at school in these subjects was no better than that of the controls. Television seems to be of no particular help to the child in making the most of his intelligence: it causes neither over- nor under-achievement.

"As a social problem the effect of television on homework is slight." (pp. 310-311, 1958).

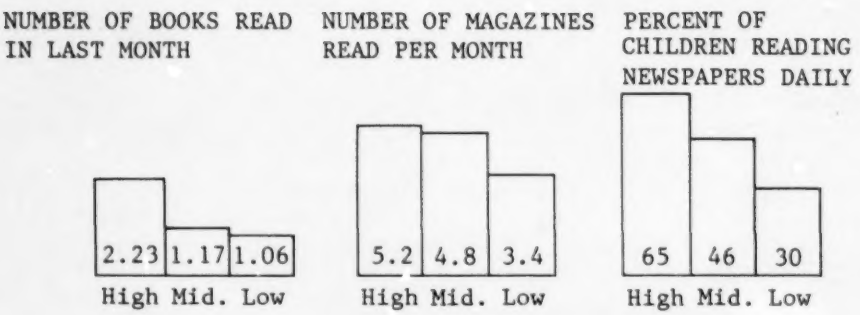
It must be remembered that this study was done when television had only recently begun to come into the communities studies. One of the more interesting findings is the suggestion of a greater effect upon the brighter children. This interaction of effect and intelligence came up again in the Schramm, Lyle, Parker study (1961), and was front and center in Furu's major Japanese study (1971).

The American study had an experimental and a control group in Canada, and made several surveys of communities where television was already in general use, in the United States. The experiment in Canada found no significant difference either in sixth or tenth grade school performance as between the town with and the town without television. It did find some differences in incidental learning, to which we have made reference earlier in this paper. That is, children with television came into the first grade with larger vocabularies -- both general vocabulary as measured by a standardized test, and special vocabulary as measured by a test of names and events in the news and in general discussion. They came into school also with a somewhat wider spread in general knowledge, but this seemed to be in the form of details, names, specifics, not general concepts or understanding or process and relationship. Heavy viewers in the first grade showed more learning of the specified kinds than did light viewers. However, all the advantage seemed to be lost during the first few years of school. At about the age of 12 there came a turning point in children's use of television and in its probable effects.

At this so called turning point, the importance of intelligence in the equation becomes readily apparent. The brighter children tend to be the heavier viewers during the first eight or ten years of life, but about age ten or from thereafter they turn to heavier use of print, and typically become the lighter viewers of television. The heavier viewers among teenage children tend to be those best able to identify singers and band leaders, the lighter viewers those best able to identify writers and statesmen. In other words, the fast start in general knowledge and vocabulary that television apparently encourages fails to last very long, and at about age 10 or 12 the situation reverses and the brighter children, those more interested in serious learning, begin to make greater use of print. Furthermore, television's prestige falls considerably. This can be illustrated by two charts from the Schramm, Lyle, Parker book (pp. 80 and 83), representing a large sample of eighth-grade children in several parts of the united States:



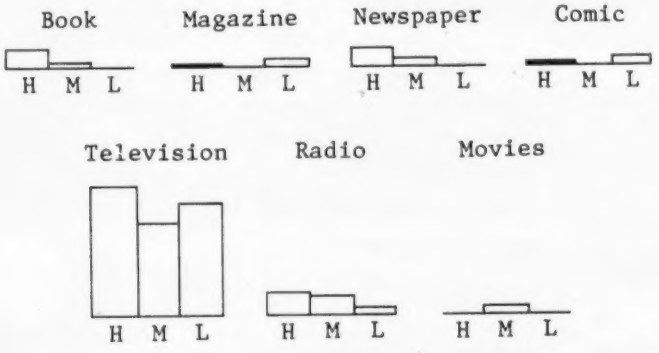
Prestige of media with eighth-grade children of different mental abilities (high, middle, low).



Reading of printed media by eighth-grade children of different mental abilities (high, middle, low).

The book we are discussing does not claim causation. It finds no significant relationship in the experimental situation. In the samples where control groups were infeasible, it discovers relationships between heavy viewing and family conflict, social norms (for example, a negative relation with the value placed on deferred gratification), personal adjustment and peer group relations, and, of course, intelligence. The relationship of televison to school performance is therefore part of a rather complex interactive relationship, not a simple matter of cause and effect. But it was clear even at the beginning of the 1960s that intelligence (and consequently in most cases higher performance in school) was associated, after age 10 or 12, with less use of television, heavier use of print, less prestige for television, and, in fact, some sense of guilt for spending a large amount of time with television. Television was regarded by older children as a source of entertainment and relaxation, and not much valued, for the serious public affairs and cultural programs it carried.

Yet, lest we make too much of this loss of prestige, it is necessary to cite one more finding from the 1961 book. Asked which medium they would miss most if they had to give it up, eighth graders gave these answers:



Percentages of eighth-grade children who would most miss each of the media, by mental ability (high, middle, low).

Thus, regardless of the fact that they thought of television as mostly useful for entertainment, the brighter children, even more than the others, said they would miss television most.

Furu's study, conducted in 1970 in Tokyo and its environs, made use of many of the scales and concepts of the Schramm and Himmelweit studies, and was able to go farther than the others in analyzing the elusive relationship between amount of viewing and school performance. Using a cluster sample with the school as unit, he selected, by systematic random sampling, 1800 tenth graders, 560 seventh graders, and 510 fourth graders. He secured measures, not only of viewing, print media use, and leisure time use, but also intelligence, creativity (a special Japanese test), adaptability (mostly questions on personal adjustment), social norm (immediate or deferred rewards), positivity (positive vs escapist behavior), parent-child conflict, reference group (parents' or peers' social norms), group membership (close friends or family), viewing situation, self-control of TV viewing, and the like.

This was a complex study and we cannot discuss it at length here. The point of greatest interest to us at the present time: Furu found, on his analysis of variance, a significant relationship between amount of viewing of television and school achievement scores in each of the three grades he studied. Part of his summary was as follows (pp. 150-52):

1. For each grade the school achievement score for high-intelligence groups was naturally higher than for the low-intelligence groups . . .

2. The school achievement score of the high-TV group was lower than that of the low-TV group for every grade . . .

3. The effects of print exposure were significant only for the seventh grade . . .

4. The effect of the interaction of intelligence and TV was not significant in any grade. This means that the effect of heavy viewing on school work was not affected by intelligence.

5. Regardless of the level of intelligence, the record of the high-print group was higher than that of the low-print group. In the tenth grade the difference was not significant . . .

6. In each grade the record of the print-type was higher than that of the TV-type . . .

The nature of his analyses of variance can be illustrated by the tenth grade analysis, which comes closest to the age when our own students take the SAT:

Source	df	MS	F	P
Intelligence	1	112.541	9.730	.01
Television	1	53.245	4.603	.05
Print	1	13.411	1.159	
Intelligence times TV	1	19.941	1.724	
Intelligence times print	1	0.590	0.051	
Intelligence times TV times print	1	1.153	0.100	
Error	485	11.566		
			n = 493	

These findings seem to establish a close and consistent relationship between higher-than-average viewing of television and lower-than-average school achievement. But Furu is too careful a researcher to stop there. He assumed that a number of other variables are also important in determining the quality of school. Therefore, he introduced some of his other measures -- intelligence, adaptability, creativity, positivity, parent-child conflict -- along with a measure of TV and print behavior first used by Schramm, Lyle, and Parker, into a Hayashi multi-way analysis of fourth and seventh graders, using school achievement scores as dependent variables. This type of analysis combines multiple and partial correlations, and aims to determine whether one of the variables is significantly correlated with the dependent variable regardless of the effect of the other variables. The measure of TV and print behavior creates four groups by dichotomizing the subjects in different combinations above and below a midpoint. Thus:

High users -- both TV and print above midpoint
TV-type -- TV above midpoint, print below
Print-type -- print above midpoint, TV below
Low users -- both TV and print below midpoint

His purpose was to find out whether the TV-print difference was significantly related to school performance when the effect of the other variables was held steady. This is not quite the same as examining only the effect of high viewing of TV, but in a sense represents a purer measure.

By chi-square, all these variables are related to school work at a highly significant level (TV-print behavior, for example, at .001 and .005 in the two grades respectively). But when the partial correlations are obtained, the results are somewhat different. Intelligence, of course, is the chief correlate, as may be judged from the analysis of variance. But TV-print is not significant at the .01 level in either the fourth or the seventh grade (it apparently is significant at .05 in the fourth grade). Creativity, positivity, and parent-child conflict are significant at .01, along with intelligence, in the fourth grade; social class, adaptability, creativity, and social norms, along with intelligence, in the seventh grade. He says: "We can conclude that the lower achievement of heavy viewers is due not to the direct effects of TV but to the intervening effects of such predispositions as intelligence, creativity, adaptability, and so forth" (p. 163).

In Conclusion

Where does this review leave us? A bit frustrated and puzzled, perhaps, because we do not have clearer and more decisive evidence. Yet there are some conclusions that seem reasonable:

1. Television viewing is related to school performance and therefore very possibly to test scores: higher-than-average amounts of viewing, other things being equal, tend to be associated with lower-than-average academic performance.

2. When television comes into a family, it tends to reduce the amount of reading, and therefore provides less practice in that skill and less use of the cognitive and cultural material that print provides.

3. Television takes an enormous part of a child's life, and for most

children above the ages of nine or ten this activity is not very stimulating intellectually. Viewing television often gives a child a fast start with vocabulary and general knowledge, but in the early years of school the child outruns the intellectual level of television and uses the medium mostly for entertainment and relaxation.

4. A number of studies have found that television interferes somewhat with homework and keeps a number of children up late.

5. Television has shifted the balance of a child's practice away from learning from print (linear, verbal) to learning from pictures (simultaneous iconic). Most achievement tests, of course, depend largely on the former.

6. If television has anything to do with the kind of academic performance represented by the SAT scores, the early 1960s would be about the time we should expect the effect to show up. Actually the decline began in 1963.

7. However, a relationship is not necessarily a direct effect. The relationship to school work and probably to test scores is highly likely; the effect is neither proved nor disproved. However, considering the large number of powerful personal and social variables involved in academic performance -- intelligence, personal adjustment, relations with parents and peers, social norms, home and school situation, and so on -- would it not be extremely unlikely if we were to find a strong effect of television viewing independent of all these other variables? Furu calls them intervening variables, meaning that television acts through the others upon academic performance. It might be better to call them interacting variables, meaning that they act and react with and upon each other. This is to say, if adjustment affects television behavior, televison behavior may also affect adjustment, and both affect and are affected by social relationships; and just as they have something to do with performance in school, so the school experience may affect adjustment and social relations and the amount and kind of television one watches.

We can say that television is one of a group of strong variables that interact with each other and with school performance. On the degree to which television contributes to that system of interactions it is best to suspend judgment. But it is safe to say that whatever television viewing contributes, on the average, to a high school student's academic record or his performance in college entrance examinations it is more likely to be on the downward than the upward side.

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